PB90-186461

Superfund Record of Decision (EPA Region 5)
Electric Machinery Site, Waite Park Wells, MN
(First Remedial Action), September 1989

(U.S.) Environmental Protection Agency, Washington, DC

29 Sep 89

U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/RO5-89/115	2.	3. Recipient's Accession No. PB 90 18.6461/AS
4. Title and Subtitle SUPERFUND RECORD OF DECISION Waite Park Wells, MN First Remedial Action - Final			5. Report Date 09/28/89
7. Author(s)			8.
9. Performing Orgainization Name and Address			8. Performing Organization Rept. No. 10. Project/Task/Work Unit No. 11. Contract(C) or Grant(G) No. (C) (G)
12. Sponsoring Organization Name and Address U.S. Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460			13. Type of Report & Period Covered 800/000
15. Supplementary Notes			14.

16. Abstract (Limit: 200 words)

The 45-acre Waite Park Wells site is in Waite Park, Stearns County, Minnesota, 1,500 feet east of the Sauk River. Waite Park municipal wells #1 and #3 served the city until December, 1984 when routine sampling detected organic contamination in the ground water. The contaminated plume extends east-southeast from the Electric Machinery Manufacturing Company to the wells which are situated in the northeast corner of the Burlington Northern Superfund site. In January 1985 the State issued a health advisory to residents to discontinue using municipal water for drinking and cooking. A water hook up with St. Cloud, Minnesota was completed in February 1985 to provide the 3,500 Waite Park residents with an alternate water supply. In February 1988, the five responsible parties at the site funded a municipal water treatment system and wells #1 and #3 were returned to service. Remedial investigations did not identify any significant soil contamination at the site in the vicinity of the Electric Machinery Company; however, ground water contamination was identified in the shallow aquifer and, to a lesser extent, in the deep aquifer. This Record of Decision represents the final response action for the Electric Machinery portion of the Waite Park Wells site. The primary contaminants of concern in the ground water are VOCs including PCE and TCE. (Continued on next page)

17. Document Analysis a. Descriptors

Record of Decision - Waite Park Wells, MN
First Remedial Action - Final
Contaminated Medium: gw
Key Contaminants: VOCs (PCE, TCE)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 47
	20. Security Class (This Page) None	22. Price A03

(See ANSI-Z39.18) *See Instructions on Reverse*

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

16. Abstract (Continued)

The selected remedial action for the site includes ground water pumping and onsite treatment of the contamination plumes of both the shallow and deep aquifers using packed towers aeration (air stripping); discharge of treated ground water from the packed tower aeration system to the Sauk River under an NPDES permit; and surface water monitoring and long-term ground water monitoring. The estimated present worth cost for this remedial action is $913,000. O&M costs were not provided.

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

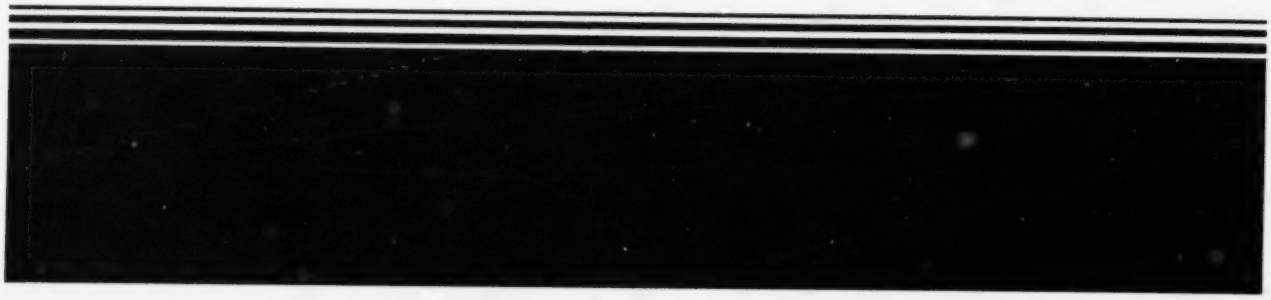
EPA/ROD/R05-89/115
September 1989

PB90-186461

EPA

Superfund Record of Decision:

Waite Park Wells, MN



REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

DECLARATION STATEMENT
RECORD OF DECISION

SITE NAME AND LOCATION

Waite Park Wells
Electric Machinery Site
St. Cloud, Stearns County, Minnesota

STATEMENT OF BASIS AND PURPOSE

This decision document serves as the United States Environmental Protection Agency's (U.S. EPA's) concurrence with and adoption of the remedial action decision for the Electric Machinery portion of the Waite Park Wells Site, as selected by the Minnesota Pollution Control Agency (MPCA), in conformance with the Minnesota Environmental Response and Liability Act and pursuant to Sections 104(d) and 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The State has provided U.S. EPA with documentation to demonstrate that the State's selection of the remedy conforms with the requirements of the CERCLA, as amended by Superfund Amendments and Reauthorization Act (SARA), and the National Contingency Plan, to the extent practicable.

The State has arranged for the Responsible Parties to undertake remedial action at the Electric Machinery portion of the Waite Park Wells Site, and has sought U.S. EPA concurrence in adoption of the remedy which has been selected. The U.S. EPA concurrence with the State's selected remedy is based upon the documents listed in the attached administrative record and the adequacy and completeness of those documents, as represented by the State. The State is responsible for developing and maintaining an entire administrative record on the site for its decision-making purposes.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the Electric Machinery portion of the Waite Park Wells Site, if not addressed by implementing the selected remedy, may present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

The final remedy for the Electric Machinery portion of the Waite Park Wells Site prevents migration of contaminants to the City of Waite Park municipal wells and restores the contaminated aquifer.

The major components of the selected remedy are as follows:

- Install groundwater extraction wells in the contamination plumes;

- Treat contaminated groundwater via packed tower aeration; and

- Discharge treated groundwater from the packed tower aeration system to the Sauk River under an NPDES permit.

In addition, the Responsible Parties are restricting access to the site with a security fence and a security system.

DECLARATION

The selected remedy is protective of human health and the environment, and complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action. The selected remedy is cost-effective since it provides the necessary overall effectiveness proportional to its cost, while accomplishing remediation of both the shallow and deep aquifers. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. However, because treatment of the hazardous substances in the groundwater and soils was not found to be practicable, this remedy does not satisfy the statutory preference for treatment of hazardous substances in the groundwater and soils as a principal element of the remedy. The aeration treatment of the groundwater transfers the hazardous substances into other media. Air quality emissions modeling demonstrates that contaminants from the groundwater will be transferred and assimilated into the atmosphere through packed tower aeration, at a rate and concentration that is protective of human health and the environment. The NPDES permit requirements will ensure that the discharge to the Sauk River is protective of human health and the environment. The cost of granular activated carbon treatment outweighs any benefit of this additional treatment. In addition, active treatment of the isolated areas of soil contamination is not necessary, since passive flushing of the soils will be collected within the capture zone of the groundwater extraction wells. These soils are vegetated and enclosed within the site fence and security system to avoid human contact.

Because this remedy will result in hazardous substances remaining on-site in isolated areas with soil contamination, the State is expected to supply information such that the U.S. EPA can conduct a review, no less than 5 years after commencement of remedial action, to ensure that the remedy continues to provide adequate protection of human health and the environment.

U.S. EPA reserves the right to take enforcement actions under Sections 106 and 107 of the CERCLA against the Responsible Parties to assure that the remedy, as well as any necessary additional future work, is undertaken.

Frank M. Covington

for Valdas V. Adamkus
Regional Administrator

9/28/89
Date

ADMINISTRATIVE RECORD TO THE U.S. EPA DECLARATION WAITE PARK WELLS SITE
ELECTRIC MACHINERY

DOCUMENTS

1. Remedial Investigation Report, May 1987.

2. Results of Additional Investigations/Feasibility Study, January 1988, revised April 1988.

3. ATSDR Health Assessment, December 1988.

4. Correspondence dated December 1988, sent to Responsible Parties regarding Air Quality Emissions Modeling Evaluation Results.

5. Record of Decision, January 1989.

6. Letter transmitting this Declaration Statement to MPCA.

BRUCE - please let me know what you think of this

Norm 1/26

Minnesota Pollution Control Agency

January 23, 1989

Mr. Norm Neidergong
U.S. Environmental Protection Agency
Region V
5HR-11
230 South Dearborn Street
Chicago, Illinois 60604

Dear Norm:

Enclosed is a copy of the executed Record of Decision (ROD)for the EM portion of the Waite Park Ground Water Contamination NPL site.

If there is anything the MPCA can do to assist EPA in this matter please let me know. ROD's for the U.S.Steel and Agate Lake sites will be forwarded to you shortly.

Sincerely,

Gary Pulford
Chief, Site Response Section
Ground Water and Solid Waste Division

GP:ar

Enclosure

RECEIVED
JAN 25 1989
REMEDIAL &
ENFORCEMENT
RESPONSE BRANCH

Phone:_____
520 Lafayette Road, St. Paul, Minnesota 55155
Regional Offices • Duluth/Brainerd/Detroit Lakes/Marshall/Rochester
Equal Opportunity Employer

Minnesota Pollution Control Agency

January 11, 1989

Mr. Johann Wagner
BBC Brown Boveri & Company Limited
1460 Livingston Avenue
North Brunswick, New Jersey 08902

Mr. Michael O'Brien
Cooper Industries, Inc.
First City Tower, Suite 4000
P.O. Box 4446
Houston, Texas 77210

Mr. Robert Guggenberger
Plant Manager
Brown Boveri Turbomachinery
711 Anderson Avenue
St. Cloud, Minnesota 56302

Mr. R. G. Ernst, Manager
Electric Machinery Manufacturing Co.
800 Central Avenue Northeast
Minneapolis, Minnesota 55413

Mr. LeRoy DeNooyer
Dresser Industries, Inc.
P.O. Box 718
1600 Pacific
Dallas, Texas 75221

Gentlemen:

RE: Electric Machinery Site Record Of Decision

The Minnesota Pollution Control Agency (MPCA) staff is pleased to send the above mentioned Responsible Parties (RPs) the enclosed executed copy of the Record of Decision (ROD) for the Electric Machinery (EM) Site, St. Cloud, Minnesota. Execution of the ROD will now allow for approval of the EM Revised Additional Investigations/Response Action Alternatives Report and the Response Action Work Plan by the MPCA Commissioner.

The MPCA staff would again like to invite the RPs to enter into Consent Order negotiations at this time, for the response action design, implementation, and long term monitoring of the packed tower aeration system. The MPCA staff requests that RPs respond in writing within ten days of receipt of this letter, their willingness and preference to enter into negotiations of a Consent Order.

If you have any questions regarding the ROD, please contact me at (612) 296-7745.

Sincerely,

Lonna Beilke

Lonna J. Beilke
Project Manager
Responsible Party Unit I
Site Response Section
Ground Water and Solid Waste Division

LJB:ah

cc: The Honorable Sam Huston, Mayor, St. Cloud
The Honorable Al Ringsmuth, Mayor, Waite Park
Doug Connell, Barr Engineering Company
Julie Mathiesen, U.S. Environmental Protection Agency

Declaration

SITE NAME AND LOCATION

Electric Machinery Site
711 Anderson Avenue
St. Cloud, Stearns County, Minnesota

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Electric Machinery Site developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Minnesota Environmental Response and Liability Act (MERLA), and the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300).

DESCRIPTION OF THE SELECTED REMEDY

The final remedy for the Site was developed to protect public health and the environment by preventing migration of contaminants to the city of Waite Park municipal wells and by restoring the contaminated aquifer.

The major components of the selected remedy are as follows:

- Install ground water extraction wells in the contamination plumes;

- Treat contaminated ground water via packed tower aeration; and

- Discharge treated ground water from the packed tower aeration system to the Sauk River.

DECLARATION

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate for this remedial action, and is cost effective. The remedy utilizes permanent solutions and alternative or resource recovery technologies to the maximum extent practicable for the pump out and treatment of contaminated ground water from the Electric Machinery Site. Neither treatment nor any other type of remedy is necessary for the isolated areas of contaminated soils remaining on-site in order to protect human health and the environment or attain applicable or relevant and appropriate requirements.

Michael Robertson

by Gerald L. Willet Deputy
Commissioner
Minnesota Pollution Control Agency

1-5-89
Date

ELECTRIC MACHINERY SITE
ST. CLOUD, MINNESOTA
RECORD OF DECISION

I. SITE NAME, LOCATION AND DESCRIPTION

The city of St. Cloud, with a population of about 43,000, is located in central Minnesota, about 70 miles northwest of Minneapolis-St. Paul (see Figure 1). St. Cloud is the county seat of Stearns County. The Electric Machinery Site (the Site), consists of approximately 45 acres. The extent of the plume of contaminated ground water associated with the Site extends from the Electric Machinery Site approximately 2,000 feet to the east-southeast to Waite Park Municipal Wells No. 1 and 3. The Waite Park Municipal Wells are located in the city of Waite Park, also in Stearns County, which has a population of approximately 3,500. Adjacent to the south of the Electric Machinery Site is the Burlington Northern St. Cloud Car Shop Site (the BN Site), also located in Waite Park. The Waite Park Municipal Wells are located in the northeast part the BN Site (see Figure 2). The Site plus the BN Site together compose the Waite Park Ground Water Contamination Site. The Waite Park Ground Water Contamination Site is listed on the National Priorities List (NPL) with a Hazard Ranking System score of 32. The Waite Park Ground Water Contamination Site is also listed on the Minnesota Permanent List of Priorities (PLP).

The two Waite Park municipal wells serve the city of Waite Park, supplemented by City Well #2, which has limited capacity. City Well #2 is located approximately 2000 feet south of the Site, outside the area of contamination. After discovery of ground water contamination in Wells #1 and #3, these wells were removed from service and water was obtained from the city of St. Cloud. The city of Waite Park also installed an additional well near Well #2, however neither well has sufficient capacity to be relied upon for the City's water supply.

The Site is situated between the Sauk and Mississippi Rivers at an elevation of approximately 1050 MSL on the sand plains of central Minnesota. The Site is located approximately 1,500 feet east and southeast of the Sauk River. The ground surface on the Site is relatively level with a total vertical relief of less than 20 feet.

The general geology in the vicinity of the Site consists of surficial outwash and alluvial deposits underlain by fine-grained glaciolacustrine sediment, till and buried outwash. Up to 135 feet of these sediments have been found to be deposited on top of Precambrian granite bedrock in the vicinity of the Site.

The surficial outwash forms a shallow water table aquifer beneath most of the Site and the surrounding area. The shallow aquifer is generally separated from a deeper buried outwash aquifer by fine-grained glaciolacustrine and till units. The deeper aquifer beneath the Site rests on a fine-grained, sandy clay till. The till may rest directly on the bedrock in places, although a thin zone of sand may separate the lower till from bedrock. The granite bedrock is not considered an aquifer. Both the surficial and buried outwash aquifers appear to discharge to the Sauk River. Ground water flow is generally to the north under non-pumping conditions. Figures 3 and 11 show ground water elevations under non-pumping conditions in the shallow and deep aquifers. Figures 5 and 6 show

ground water elevations under pumping conditions in the shallow and deep aquifers following return to service this year of the Waite Park Municipal Wells.

Land use in the vicinity of the Site consists primarily of light industrial and warehousing.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

In December 1984 and January 1985, routine samples of Waite Park municipal wells #1 and #3 were obtained and analyzed by the Minnesota Department of Health (MDH) for volatile organic compounds (VOC's). The following VOC's were detected: acetone (up to 300 ug/L), bromodichloromethane (up to 1.6 ug/L), chloroform (up to 4.2 ug/L), 1,1-dichloroethane (up to 200 ug/L), 1,2-dichloroethane (up to 0.9 ug/L), 1,1-dichloroethene (up to 30 ug/L), cis and trans-1,2-dichloroethene (up to 5.9 ug/L), 1,1,2,2-tetrachloroethene (up to 300 ug/L), and 1,1,2-trichloroethene (up to 14 ug/L). Of these chemicals, 1,1-dichloroethene, 1,1,2-trichloroethene, and 1,1,2,2-tetrachloroethene are suspected or known carcinogens.

In January 1985 the MDH issued a health advisory to Waite Park residents to discontinue using municipal water for drinking and cooking. Also in January 1985 the MPCA Commissioner issued a Determination of Emergency. A temporary supply was provided until a hook-up with the city of St. Cloud was completed in February 1985. The Determination of Emergency allowed use of State Superfund monies to begin a Limited Remedial Investigation (LRI) which was initiated immediately. The LRI involved placement of soil borings, installation of monitoring wells, measurement of water levels in wells, and sampling of private wells in the area. Monitoring wells were installed on both the Site and the BN Site. The results of the LRI were reported in November 1985 and concluded that the Site was one of several sources of contamination affecting the City's wells. The LRI report recommended additional investigation at the Site. Simultaneous with the LRI, the MPCA conducted a water supply focused feasibility study for the city of Waite Park. In March 1986 the Commissioner selected the addition of treatment (air stripper) to existing City Wells #1 and #3 as the most appropriate long term water supply response action alternative.

The MPCA issued a Request For Response Action (RFRA) to Burlington Northern in October 1985. A RFRA was issued to BBC Brown Boveri & Company, Ltd. (Brown Boveri) and Cooper Industries in March 1986. In September 1986 a RFRA was issued to Dresser Industries, Inc. (Dresser Industries) and Electric Machinery Manufacturing Company (Electric Machinery). Each of the RFRAs directed the five companies named (the responsible parties or RPs) to complete following specific response actions: preparation and implementation of a water supply response action plan to implement the selected alternative, remedial investigation and feasibility study (RI/FS) at the Site (or the BN Site in the case of Burlington Northern), and response action plan (RAP) and response action (RA) implementation.

Since the issuance of the RFRAs, the water supply response action has been jointly funded and implemented by Burlington Northern, Brown Boveri, and Cooper Industries. (Cooper Industries assumed the responsibilities of Dresser Industries and Electric Machinery under their RFRA.) City Wells #1 and #3 were returned to service in February 1988 with initiation of the municipal water treatment system. The Electric Machinery Site RI final report, submitted by

Brown Boveri, was approved in July 1987, subject to satisfactory completion of a limited supplemental investigation of soil and ground water contamination in the southwest portion of the Site. This additional work was undertaken separately by Brown Boveri and Cooper Industries in fall 1987 and was completed in late 1987. The RPs jointly submitted the Site feasibility study in January 1988 with a revision submitted in April 1988. The RPs completed the RI/FS in accordance with the RFRAs and with MPCA staff oversight.

III. COMMUNITY RELATIONS

Public interest and media coverage of the ground water contamination in Waite Park was highest during the period immediately following discovery of the contamination. Although extensive media coverage was given to the Site during the Superfund RI/FS process, the public interest has generally been low.

A public comment period for the alternatives assessment and the recommended alternative began on August 10, 1988. Copies of the Revised Results of Additional Investigations/Assessment of Response Action Alternatives Report and a fact sheet detailing the alternatives evaluated and the recommended alternative were made available to the community at that time. The St. Cloud Public Library served as the information repository for the documents. Copies of these documents were also made available at the Waite Park Public Library. The MPCA issued a press release to the affected media and all environmental organizations in the State announcing the public comment period and the recommended alternative.

The Waite Park City Council was informed of the findings of the alternatives assessment and the recommended alternative, and the MPCA staff appeared before the St. Cloud City Council on August 15, 1988, to present the findings of the RI, the alternatives assessment, and the recommended alternative. The council members and a member of the general public had questions about the proposed alternative. These questions were addressed by MPCA staff at the meeting. No additional comments were received by the MPCA from the city council meeting.

The public comment period ended August 31, 1988, no public comments to the recommended alternative were made. Judging from the lack of public comment, the MPCA believes that there are no major concerns in the community with the recommended selected alternative.

IV. SCOPE OF RESPONSE ACTION

This remedy represents the final response action for the Electric Machinery Site except for long term ground water monitoring to determine the effectiveness of the pump out system. As a result of this response action, the principal threat at the Site, contaminated ground water, will be mitigated.

V. SITE CHARACTERISTICS

The nature and extent of the contamination at the Site, as determined from the remedial investigations conducted to date, is described below.

RI activities at and in the vicinity the Site included soil borings, test excavations, installation and sampling of monitoring wells, measurement of water levels, and soil gas sampling. To date, 32 monitoring wells have been

installed at 23 locations. More than 100 soil borings or temporary soil gas sampling points were installed during the RI. In addition, several wells previously installed for either private water supply or as part of the BN Site remedial investigation were also sampled. The locations of monitoring wells are shown on Figure 7.

A. Ground Water

Ground water samples collected during the RI identified the presence of several VOC's in the shallow and deep aquifers on and off the Site. Ground water contamination at the water table and capillary fringe was investigated using soil gas techniques. The contaminant with the highest on-site concentration is tetrachloroethene (PCE), although trichloroethene (TCE) and 1,1,1-trichloroethane (TCA) are also present at significant levels. PCE has been found on-site in the shallow aquifer at concentrations as high as 34,000 ug/L. Figure 8 shows concentrations of total halogenated VOC's for the shallow aquifer. The deep aquifer has been less severely affected with the highest PCE concentrations of approximately 600 ug/L found in both on and off-site wells. Figure 9 shows concentrations of total halogenated VOC's for the deep aquifer. Other contaminants on-site at lesser concentrations include 1,1-DCA (maximum contamination 380 ug/L) and 1,2-DCE (maximum concentration 4,000 ug/L).

Analysis of contaminant distribution in the two aquifers and consideration of the effect of the Waite Park municipal wells while in operation indicate that VOC contaminants first affected the shallow aquifer under the Site. These contaminants were then entrained with ground water moving east toward the city wells when they were pumping. Just east of the Site, at monitoring well EM-22, a "window" between the shallow and deep aquifers exists, allowing contaminants to pass from the shallow aquifer to the deeper aquifer. The contaminants were then induced to travel to the city wells which draw water from the deeper aquifer. Also, contaminants have moved downward on-site to some extent from the shallow aquifer to the deeper aquifer through the intervening till layer. Since the Site lies near the outer limit of the city well field capture zone, relatively lower concentrations of VOC's in the shallow aquifer have migrated a short distance to the north from a source area in the southwest part of the Site, and have also migrated in both the shallow and deep aquifers a short distance north of the main plant building from source areas immediately south of the main plant building. No off-site impact on potable water supplies from this migration have been identified.

B. Soil

As mentioned above, extensive soil sampling and investigation has been conducted at the Site. Soil borings and soil sampling was conducted over most of the Site, with emphasis on the south one-half of the Site. Samples were analyzed using an Organic Vapor Analyzer (OVA) or gas chromatograph (GC) headspace analyses for VOC's. Although there are some very localized areas of soil contamination, no significantly contaminated soil requiring specific remedial action has been identified. In addition, there are only a few locations where measurable contamination occurs near the surface.

Based on the RI, it appears the VOC's that were released on or near the surface entered the generally sandy soils underlying the Site, some of which have since been flushed by precipitation into the shallow ground water or have volatilized

into the atmosphere. According to the supplemental RI, less than 55 cubic yards of soil containing >10 mg/kg total VOC's currently remain at several locations on the Site. Figure 10 shows the maximum OVA readings measured in soil above the water table.

VI. SUMMARY OF RISKS

An evaluation was performed using monitoring data collected prior to and during the RI to estimate the potential impacts to human health and the environment.

Because the entire area is served by municipal water, the human exposure pathway of greatest concern is inhalation of volatiles from soil or ground water. Minor amounts of volatiles may be released to the atmosphere from the soil, however, measurable release from undisturbed soil to the atmosphere has not been identified. Direct human exposure to contaminated soils is not possible since the Site is fenced and a security system is in place. The exposure pathway of greater concern is transfer of volatiles from ground water to air by the selected remedy of packed tower aeration treatment. No pathway currently exists where environmental receptors in the Sauk or Mississippi Rivers may be exposed to contaminated ground water, since the contaminated ground water does not appear to have reached or discharged to either of these rivers.

A. Health Risk Assessment

The Minnesota Department of Health (MDH) has prepared a health assessment of the Waite Park Water Supply for the Agency for Toxic Substances and Disease Registry (ATSDR). The health assessment addresses both the EM and EN sites. The following is a summary of the health assessment as it relates specifically to the EM Site.

Contaminants of concern at the Site include tetrachloroethene (PCE), trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), 1,2-dichloroethene (1,2-DCE), and 1,1-dichloroethane (1,1-DCA).

PCE is classified as a probable human carcinogen. MDH has adopted as a Recommended Allowable Limit (RAL) a concentration of 6.7 ug/L based on lifetime ingestion of 2 liters per day presenting an increased cancer risk of one excess cancer per one hundred thousand population. No Maximum Contaminant Limit (MCL) has been established for PCE.

TCE is also classified as probable human carcinogen. MDH has adopted a RAL concentration of 31.2 ug/L based on lifetime investigation of 2 liters/day presenting an increased cancer risk of one excess cancer per one hundred thousand population. EPA has established an MCL for TCE of 5 ug/L. This concentration corresponds to a lifetime risk of 2×10^{-5}

1,1,1-TCA is classified as a Group D Carcinogen - Not Classified chemical. At this time there is not enough information available to further classify this chemical. MDH has adopted a RAL of 200 ug/L representing a threshold or no-impact concentration for lifetime ingestion of 2 liters/day. No MCL has been established for 1,1,1-TCA.

1,1-DCA is classified as a Group D Carcinogen - Not Classified chemical. At this time is there not enough information available to further classify this

chemical. MDH has adopted a RAL of 810 ug/L representing a threshold or no-impact concentration for lifetime ingestion of 2 liters/day. No MCL has been established for 1,1-DCA.

1,2-DCE is not classified as a carcinogen by EPA Carcinogen Assessment Group (CAG). The EPA Office of Drinking Water (ODW) has derived a Lifetime Health Advisory of 70 ug/L based on lifetime ingestion of 2 liters/day. No MCL has been established for 1,2-DCE.

As stated previously, the entire area is served by municipal water, therefore there is no direct human exposure to contaminated ground water. The Site is, however, at least partly within the Waite Park Municipal Well field and has contributed to public exposure prior to the discovery of municipal well contamination in 1984. The length of exposure is not known, but exposure could not have occurred prior to 1969 when operations at the Site began. With the treatment system installed on the Waite Park municipal system, the water supply is no longer contaminated.

Regarding contaminated soils at the Site, direct human exposure to these materials is not possible, since the area is vegetated, is completely fenced, and a security system is in place. Measurable VOC emissions from undisturbed soil to the atmosphere have not been identified.

The greatest remaining human exposure concern is via air which may contain low-level VOC's from soils and ground water, or by VOC's from the air stripper on the municipal water supply, or the on-site air stripper included in the selected remedy. Air impacts are discussed in the following section.

Regarding exposure to contaminant mixtures, MDH staff has stated that at the concentrations identified in 1984, persons consuming water from the Waite Park Municipal Wells (which contain contaminants similar to the EM Site) were at minimal risk for effects other than cancer from ingestion of PCE, TCE and 1,1-DCE, although the risks from ingestion of the mixture is unknown.

B. Environmental Assessment

Soil samples taken at the Site indicate limited contamination of this media. Soil contamination on the Site consists of VOC's, primarily south of the main building. The limited soil contamination that has been identified is typically found between 1.5 and 15 feet in depth, although some minor near-surface contamination has been identified. There is an estimated 55 cubic yards of subsurface contaminated soil in several locations. In the past, contaminants in the soil have leached into the aquifers below the Site. Based on extensive and detailed soil sampling and analysis, significant leaching of VOC's to the ground water beneath the Site does not appear to be occurring at this time. In fact, analysis of soil at or beneath the water table indicates most of the VOC leaching may have already occurred and only limited additional leaching of soils downward to the shallow aquifer will take place.

When the Waite Park municipal wells are pumping, ground water flow is towards the municipal wells in the deep aquifer, and water is pulled very slowly through the confining layer or more directly through a "window" in the confining layer

just east of the Site. This action also transports contaminants from the shallow aquifer into the deeper aquifer. As a result, the municipal wells have been impacted by contaminants from the EM Site.

During the period of January 1985 to February 1988 the municipal wells were not pumping. As a result, contaminants appear to have moved northward a short distance under influence of the aquifers under non-pumping conditions. Now that the municipal wells are back on-line and on-site recovery wells in both the shallow and deep aquifers will be operating, contaminant migration will be reversed and controlled.

The Sauk River in the only surface water body near the Site. There is no evidence the Site has or will affect the Sauk River.

Although instrument readings of air at the Site have not been above background, low levels of VOC's (below instrument detection limits) may be in the air above the contaminated soil at the Site. Possible low level air VOC's could result from gradual release through the soil column of VOC's in the soil or in the upper part of the shallow aquifer. VOC emissions to the air will result from the selected remedy of the air stripper unit and discharge to the Sauk River. Modeling of the selected remedy has been completed to ensure that the combined effects of the air stripper at Waite Park Municipal Wells #1 and #3 and the air stripper at the Site will not have adverse effects on the ambient air quality and will meet all air quality criteria.

C. Comparison to ARAR's

The concentrations of contaminants found in the monitoring wells associated with the Site and Waite Park Municipal Wells #1 and #3 which exceed Federal and State applicable or relevant and appropriate requirements (ARARs), or criteria that are to be considered, are shown in Table 1.

On the Site, maximum concentrations of TCE and 1,1,1-TCA exceeded MCL's and PCE, TCE, 1,1,1-TCA and 1,2-DCE exceeded Minnesota RAL's. ARARs are discussed further in Section X.

VII. DOCUMENTATION OF SIGNIFICANT CHANGES

No significant changes in the selected remedy have been made since the public meeting and release of the Fact Sheet/Proposed Plan.

VIII. DESCRIPTION OF ALTERNATIVES

A. Objectives for Remediation

The primary response objective is to abate or minimize the continued migration of volatile organic compounds from the Site through the ground water system. The RI Report, approved July 14, 1987, contained the following list of possible alternative response actions.

- No action
- Soil excavation with off-site disposal/treatment
- Soil excavation with on-site containment
- Soil excavation with on-site aeration
- Source control by air venting

- Ground water gradient control
- Ground water treatment at off-site point of use

A revised supplemental RI and Feasibility Study (FS) was submitted in April 1988. The FS evaluated a variety of response action technologies for soil and ground water contamination at the Site. These were:

- excavation of contaminated soil with disposal off-site or on-site or on-site treatment

- in-situ soil venting

- ground water gradient control with discharge to sanitary sewer or storm sewer

- treatment of water from gradient control system by granular activated carbon, packed tower aeration, packed tower aeration with air emissions treatment, and treatment at point of use.

The technology screening concluded that in-situ soil venting would not be feasible because of the small quantity of contaminated soil and the isolated nature of the areas of contaminated soil. Of the ground water treatment technologies examined, the screening concluded that the preferred technology for treating ground water from a gradient control system at the Site is packed tower aeration. Emission control may not be necessary because of the low concentration of volatile organics in the tower emissions. Treatment of discharge waters using granular activated carbon is not economically feasible for this Site.

Following the technology screening to identify feasible and effective response actions, the FS examined the following alternatives. The alternatives are listed in order of increasing effectiveness:

ALTERNATIVE I - Continued ground water monitoring

ALTERNATIVE IIA.1 - Shallow aquifer gradient control and discharge to sanitary sewer

ALTERNATIVE IIA.2 - Shallow aquifer gradient control, packed tower aeration treatment, and discharge to sanitary sewer

ALTERNATIVE IIB - Shallow aquifer gradient control, packed tower aeration treatment, and discharge to storm sewer

ALTERNATIVE IIIA - Shallow and deep aquifer gradient control and discharge to sanitary sewer

ALTERNATIVE IIIB - Shallow and deep aquifer gradient control, packed tower aeration treatment, and discharge to storm sewer

Each alternative was analyzed for effectiveness, cost, reliability, constructability, implementation schedule, and secondary environmental effects. This analysis is summarized in Table 2.

B. Alternatives After Screening

Of the six alternatives evaluated, only two, Alternatives IIIA and IIIB, are effective for both the shallow and deep aquifers. These alternatives differ only in the approach used to handle the pump-out water from the gradient control system. Alternative IIIA proposes discharge to the St. Cloud sanitary sewer, while Alternative IIIB proposes packed tower aeration treatment followed by discharge to the Sauk River via a storm sewer. Each of these alternatives is similar in effectiveness, cost, constructability, implementability, and secondary environmental effects. The remaining evaluation criteria of reliability is of great importance to the Responsible Parties. The concern for reliability is based upon uncertainty of the long-term availability and the cost effectiveness of sanitary discharge to the St. Cloud system. Because of this uncertainty, the Responsible Parties have indicated a preference for Alternative IIIB.

C. Combinations

Analysis of combinations is not applicable in this case since technology combinations are implicit in the six alternatives evaluated in the FS.

IX. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

Each of the alternatives were evaluated using a number of evaluation factors. Table 3 summarizes this evaluation, showing generally favorable and unfavorable comparisons among alternatives.

A. Overall Protection of Human Health and the Environment

Only the alternatives that include response actions for both the shallow and deep aquifers provides adequate protection of human health and the environment. Without ground water control of the deep aquifer, as included in Alternatives IIIA and IIIB, contaminated ground water in the deep aquifer will continue to migrate from the Site.

B. Compliance With ARAR's

Both of the protective alternatives, Alternatives IIIA and IIIB, are designed to attain the applicable or relevant and appropriate requirements of Federal and State environmental laws. The other alternatives will not attain ARAR's for either the surface aquifer, the deep aquifer, or both.

C. Short-Term Effectiveness

Both of the protective alternatives, Alternatives IIIA and IIIB, will provide a good degree of short-term effectiveness since control of both shallow and deep aquifers can be implemented quickly and treatment of the contaminated water will occur simultaneously with essentially no adverse impact from implementation of the remedy. The other alternatives, since they do not address the deep aquifer, the shallow aquifer, or both, do not have adequate short-term effectiveness.

D. Long-Term Effectiveness

Both of the protective alternatives, Alternatives IIIA and IIIB, provide for long-term effectiveness. Contaminated ground water will be removed from both shallow and deep aquifers and the design of the shallow aquifer recovery program will control any leaching from the limited volumes of contaminated soils that may occur over time. The other alternatives, since they do not address the deep aquifer, the shallow aquifer, or both, do not have adequate long-term effectiveness. Both protective alternatives provide for a permanent remedy.

E. Reduction of Mobility, Toxicity, or Volume

Both of the protective alternatives, Alternatives IIIA and IIIB, provide a reduction in the mobility of contaminants in both the shallow and deep aquifers by effectively controlling ground water migration. In Alternative IIIA, contaminated ground water will be discharged to and treated by the St. Cloud sanitary sewer system, thereby reducing contaminant toxicity and volume. In Alternative IIIB, reduction in toxicity and volume will rely on the assimilative capacity of the atmosphere and the Sauk River. Air emissions modeling will be done to determine the ability of the atmosphere in the vicinity of the Site to assimilate emissions from both the Waite Park Water Supply and the Site packed tower aeration systems. Discharge to the Sauk River will be required to meet National Pollutant Discharge Elimination System (NPDES) discharge requirements. The remaining non-protective alternatives will not provide a similar level of reduction in mobility, toxicity, or volume.

F. Implementability

All alternatives can be implemented when considering technical feasibility and the availability of services and material. Both of the proposed protective alternatives, Alternatives IIIA and IIIB, may encounter some administrate delay related to the various permits and approvals required. Where possible, preliminary discussions and/or review of the protective alternatives with the appropriate agencies have been conducted.

G. Cost

The protective alternatives, Alternatives IIIA and IIIB, have the highest present worth cost, $882,000 and $913,000 respectively, of the six alternatives evaluated. The non-protective alternatives range from $236,000 and $652,000 in present worth cost. The RPs have recommended the implementation of Alternative IIIB, the alternative with the highest present worth cost.

H. Community Acceptance

No specific comments were received during the public comment period regarding the proposed response action, Alternative IIIB. Given the media coverage at the public meeting, this lack of response may be inferred as community acceptance. Although not an official comment, the MPCA staff is aware that the St. Cloud Water Treatment would prefer to not receive additional volumes of water containing relatively low-levels of contaminants if other treatment and disposal options are feasible.

I. State Acceptance

The MPCA staff has selected the remedy presented below for the Electric Machinery Site.

X. SELECTED ALTERNATIVE

Based on current information, the MPCA staff selects the RPs recommended alternative, Alternative IIIB, as the most appropriate final remedy for the Electric Machinery Site. The conceptual layout of the remedy is shown in Figure 11. This remedy involves:

- Installation of ground water pump-out wells in both the shallow and deep aquifers;

- Treat contaminated water with a packed tower aeration system (air stripper); and,

- Discharge treated ground water from the air stripper to the Sauk River.

Cleanup Requirements

The three areas of concern in relation to cleanup requirements are ground water, air quality, and the Sauk River.

Grouhd water at the Site will require two separate but related actions: satisfactory capture of shallow and deep plumes moving north from the Site and removal of sufficient quantities of ground water to reduce the concentration of the remaining ground water to the required level. Capture will be achieved by the proper design, placement, and operation of the shallow and deep pump out systems. Ground water risk reduction will be achieved by continuing to operate the pump out system until the more restrictive of MCL's or RAL's for VOC's in both the shallow and deep aquifers is met. At this Site, the only instance where MCL's are more restrictive than RAL's is for the contaminant TCE where the MCL is 5.0 ug/L and the RAL is 31.0 ug/L. The cumulative excess carcinogenic risk of the two carcinogens, PCE and TCE, at the stated cleanup levels is approximately 1.2×10^{-5}. This level of protection is deemed adequate since no one at the Site is actually drinking the water or is likely to since the entire area is served by municipal water. The target clean up level for the other three contaminants of concern at the Site (1,1,1-TCA, 1,2-DCE and 1,1-DCA) are set at the MCL or RAL where no MCL is available. Upon consultation with MDH, it was determined that analysis of cumulative effects of these non-carcinogens was not needed since the systemic effects of each of these contaminants was different.

Table 4 lists each contaminant, its MCL, RAL and target cleanup level. Contaminants outside the zone of remediation at the Site which are currently being transported to the Waite Park Municipal Water Supply will be treated by the stripper at that location.

The target cleanup levels for on-site VOC contaminants listed in Table 4 may not be achievable by the selected response action. If that becomes the case, alternate concentration levels may need to be considered.

VOC's will be removed from the recovered ground water prior to discharge to the Sauk River by using an air stripper to transfer the contaminants from ground water to the atmosphere. The emissions at both the on-site stripper and the discharge point at the river have been analyzed individually and in relation to each other and the Waite Park Water Supply stripper. This analysis has determined that the total projected risk from the air emission sources associated with the recommended alternative is well below MDH action guidelines and therefore the MPCA Division of Air Quality will not require additional air emission controls.

Effluent from the air stripper will be discharged to the Sauk River. The Sauk River is not classified as a drinking water source, therefore only the lower of fish consumption and aquatic life chronic toxicity criteria will be applied to water in the Sauk River at the discharge point allowing for 7Q10 dilution. These values are also shown on Table 4. In addition, an NPDES permit will be required for the discharge. Permit limitations, as shown on Table 4, are a daily maximum of 15 mg/L total hydrocarbons with a maximum daily effluent volume of 200 gpm and an average daily effluent volume of 120 gpm. The NPDES permit will come off public notice on January 7, 1989, and will be issued in final form shortly thereafter.

The MPCA staff will require that a deed notice be placed on the property pursuant to Chapter 115B.16, Subd. 2 of the Minnesota Environmental Response and Liability Act.

Remedial Action and Operations and Maintenance

The Site is being cleaned up under the terms of a Request for Response Action (RFRA) issued to the four Responsible Parties on March 25, 1986, and September 23, 1986. The RPs have assumed responsibility for the investigation and cleanup of the Site.

XI. STATUTORY DETERMINATIONS

A. Protection of Human Health and the Environment

The selected remedy provides protection of human health and the environment through extraction and treatment of contaminated ground water using an air stripper. The aquifer restoration will prevent ingestion by the public of contaminated ground water posing a greater than 10^{-5} cumulative lifetime excess cancer risk. It is estimated that the ground water may be restored to health-based risk criteria in 5 to 10 years, although operation of the system longer than 10 years is possible.

The remedy is also protective of human health since the risk from exposure to contaminants from the air stripper will meet emissions standards which are based on 10^{-5} risk criteria. The air stripper will operate in conjunction with the ground water extraction system until the discharge can meet NPDES and Ambient Water Quality Criteria (AWQC) requirements for the Sauk River.

The discharge to the Sauk River will be protective of human health and the environment since the lower of fish consumption or aquatic toxicity will be required. The Sauk River below the discharge is neither classified nor used for

drinking water. The Sauk River enters the Mississippi River approximately four miles below the discharge; the Mississippi River is protected for drinking water at that point.

B. Attainment of ARAR's

Selected alternative, Alternative IIIB, will meet the following Federal and State ARAR's:

1. Resource Conservation and Recovery Act (RCRA); 40 CFR Part 264.

40 CFR Part 264 requires the removal of all waste residues and soil contaminated with hazardous waste. However, RCRA has not defined the level of decontamination required. EPA guidance requires that any contaminants left in subsoils will not impact any environmental media. The shallow aquifer pump-out system of the selected alternative will control any minor amounts of VOC's remaining in the subsoils that may move downward through the soil column and enter the shallow ground water beneath the Site.

2. Clean Water Act (CWA); 40 CFR Parts 122 and 125.

Treated ground water will be discharged to the Sauk River. AWQC will be met by the discharge through the requirements of an NPDES permit.

3. Safe Drinking Water Act (SDWA); 40 CFR Parts 141-146.

The SDWA specifies MCLs for contaminants at public drinking water supplies. The ground water beneath the Site is within the capture zone of the Waite Park Municipal Wells, however a treatment system is already in place for the Waite Park water supply. The Waite Park water supply is currently meeting MCLs.

4. Minn. Stats. 115 and 116 and Minn. Rules chs. 7001 and Minn. Rules pt. 7050.021.

These statutes and rules regulate surface water discharges under NPDES permits. The discharge from the treatment system will meet the quantity and quality requirements of an NPDES permit.

5. Minn. Rules pt. 7050.0220.

This rule requires that discharges to ground water which will be used for consumption attain MCLs and RALs for drinking water. The selected alternative will not discharge to ground water, however as stated previously, minor amounts of VOC's may move downward through the soil to the ground water within the capture zone of the pump-out system where they will be removed and treated.

6. Minn. Stat. § 116.07, subd. 4.A.

The operation of the air stripper will not require an air quality permit under this statute, which regulates air emissions of toxic pollutants. The emissions have been modeled and do not require additional control measures.

7. Minn. Stat. ch. 105.

Operation of the pump out system will require a Water Appropriation Permit from the Department of Natural Resources to assure a ground water supply adequate to meet long-term ground water needs. The selected alternative will meet the requirements of the water appropriation permit.

Where State ARARs are more stringent than Federal ARARs, the State requirements will be met at the completion of the remedial action.

C. Cost-Effectiveness

All costs have and will be borne by the Responsible Parties under terms of the existing RFRAs.

D. Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

The MPCA has determined that the selected remedy is the most appropriate solution for meeting the remedial action goals at the Electric Machinery Site. Extraction of the contaminated ground water will permanently restore the aquifer. Air stripping is the most appropriate treatment prior to discharge to the Sauk River. The selected remedy provides the best balance among the nine criteria. The selected remedy is a permanent solution that uses alternative treatment technologies to the maximum extent practicable.

E. Preference for Treatment as a Principal Element

The statutory preference for remedies that employ treatment which permanently and significantly reduce the toxicity, mobility, or volume of hazardous substances as a principal element is satisfied since the contaminants transferred to the air or the Sauk River will be naturally degraded.

XII. SCHEDULE

The response action for the Site is expected to be implemented in accordance with the following schedule:

- Execute ROD and approve FS — December 1988
- Complete Response Action Plan — January 1989
- Implement Response Action — February 1989

XIII. DOCUMENTS REVIEWED

Dec. 1984, Jan. 1985 samples results.

MDH health advisory, Jan. 1985.

MPCA Determination of Emergency, Jan. 1985.

Focused Feasibility Study, City of Waite Park Municipal Water Supply (late 1985, early 1986).

Selection of air stripper by MPCA Commissioner for City Wells, March 1986.

RFRA to BN, Oct. 1985.

RFRA to BBC Brown Bover and Cooper, March 1986.

RFRA to Dresser and EM, Sept. 1986.

EM Site Feasibility Study, Submitted January 1988.
Revision submitted April 1988.

Fact Sheet for EM Site prepared by MPCA, Aug. 1988.

Press Release announcing public comment period, Aug. 1988.

Barr Engineering Co., 1986, Plans/Reports Submitted Pursuant to Parts IV and V of Exhibit B to Request for Response Action, Electric Machinery Site, St. Cloud, Minnesota.

Barr Engineering Co., 1987a, Remedial Investigation Report, Electric Machinery Site, St. Cloud, Minnesota, Report prepared for Brown Boveri Turbomachinery.

Barr Engineering Co., 1987b, Work Plan for Additional Investigation Activities, Electric Machinery Site, Prepared for Brown Boveri Turbomachinery.

Braun Engineering Testing, 1986, Phase I Remedial Investigation BBT Plant Site.

ERT, 1986a, Review of Water Supply Study for the City of Waite Park, Minnesota, Report prepared for Burlington Northern Railroad.

ERT, 1986b, Work Plan for a Remedial Investigation at Burlington Northern Site in Waite Park, Minnesota, Report prepared for Burlington Northern Railroad.

ERT, 1986c, Initial Hydrogeologic Assessment for the Waite Park Site, Waite Park, Minnesota.

ERT, 1986d, Work Plan for the Long-Term Water Supply Response Action Plan for Waite Park, Minnesota, Report prepared for Burlington Northern Railroad.

ERT, 1986e, Long-Term Water Supply Response Action Plan for Waite Park, Minnesota, Report prepared for Burlington Northern Railroad.

ERT, 1986f, Addendum to the Long-Term Water Supply Response Action Plan for Waite Park, Minnesota, Report prepared for Burlington Northern Railroad, 5 pp.

ERT, 1986g, Remedial Investigation Report for the Burlington Northern Waite Park Site, Waite Park, Minnesota.

ERT, 1987, Work Plan for Supplemental Remedial Investigation, Burlington Northern Waite Park Site, Report prepared for Burlington Northern Railroad.

Hart, Fred C. and Associates, Inc., 1987, Work Plan for a Hydrogeologic Investigation, Electric Machinery Site, St. Cloud, Minnesota, Report prepared for Cooper Industries.

MPCA, 1985, Limited Remedial Investigation Final Report - Waite Park Groundwater Contamination Site.

Rieke Carroll Muller, 1985a, Preliminary Alternative Evaluation Report, Report prepared for the MPCA, 3 pp.

Rieke Carroll Muller, 1985b, Alternative Report, Water Supply and Treatment, Waite Park, Minnesota, Report prepared for the MPCA, 26 pp.

Rieke Carroll Muller, 1985c, Waite Park Water Supply Study, Task 3 Report, Detailed Evaluation of Alternatives, Report prepared for the MPCA, 31 pp.

Rieke Carroll Muller, 1986d, Waite Park Supply Study, Task 4 Report, Draft Feasibility Study Summary Report, Report prepared for the MPCA, 23 pp.

Rieke Carroll Muller, 1986e, Waite Park Water Supply Study Final Feasibility Study Summary Report, Report prepared for the MPCA, 24 pp.

Table 1

Comparison of Contaminant Concentrations
All Concentrations in ug/l (ppb)

Contaminant	Maximum Contaminant Concentration *				Other Criteria to be Considered		
					Ambient Water Quality Criteria		
	EM Site Wells	Municipal Wells	ARAR's MCL's	RAL's	Drinking Water and Fish** Consumption	Fish Consumption Only	Aquatic Life Chronic
PCE	34,000	680	NA	6.6	3.8	8.9	47
TCE	5,100	60	5.0	31.0	25	123	226
1,1,1-TCA	1,300	ND	200	200	216	454	138
1,2-DCE	4,000	11	NA	70	67	449	NA
1,1-DCA	380	270	NA	810	NA	NA	NA
1,1-DCE	ND	94	7.0	7.0	5.5	50	168
1,2-DCA	ND	7.2	NA	3.8	3.7	128	656

*Note: In transit, 1,1,1-TCA degrades completely and these degradation processes may result in the appearance of 1,1-DCE and 1,2-DCA in the municipal wells.
Includes data obtained after municipal wells returned to service in February 1988.
**Sauk River is <u>not</u> classified for drinking water use; the listed values are for comparison only.

ND - not detected
NA - not available

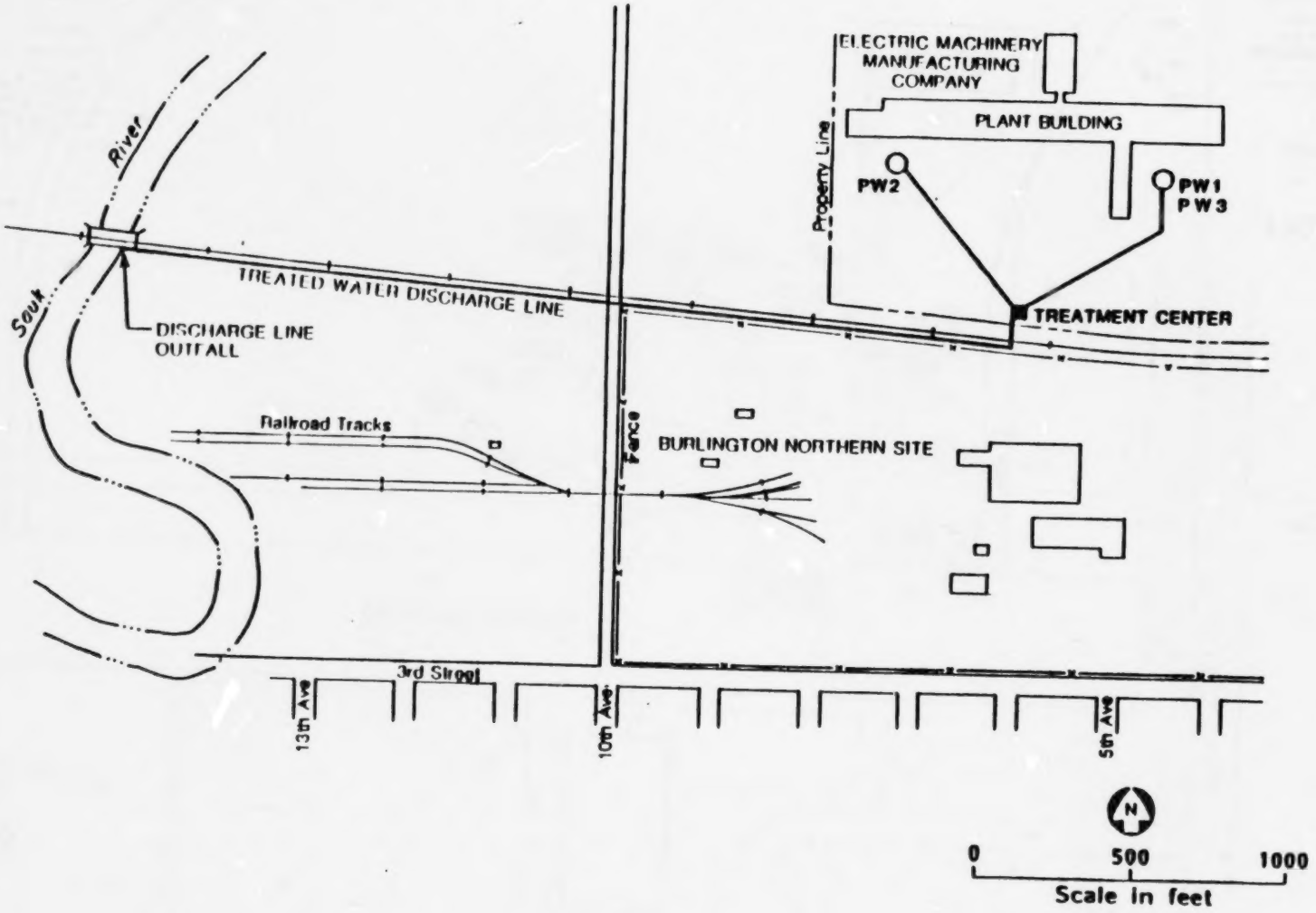


FIGURE 11

DISCHARGE LINE
CONCEPTUAL LAYOUT

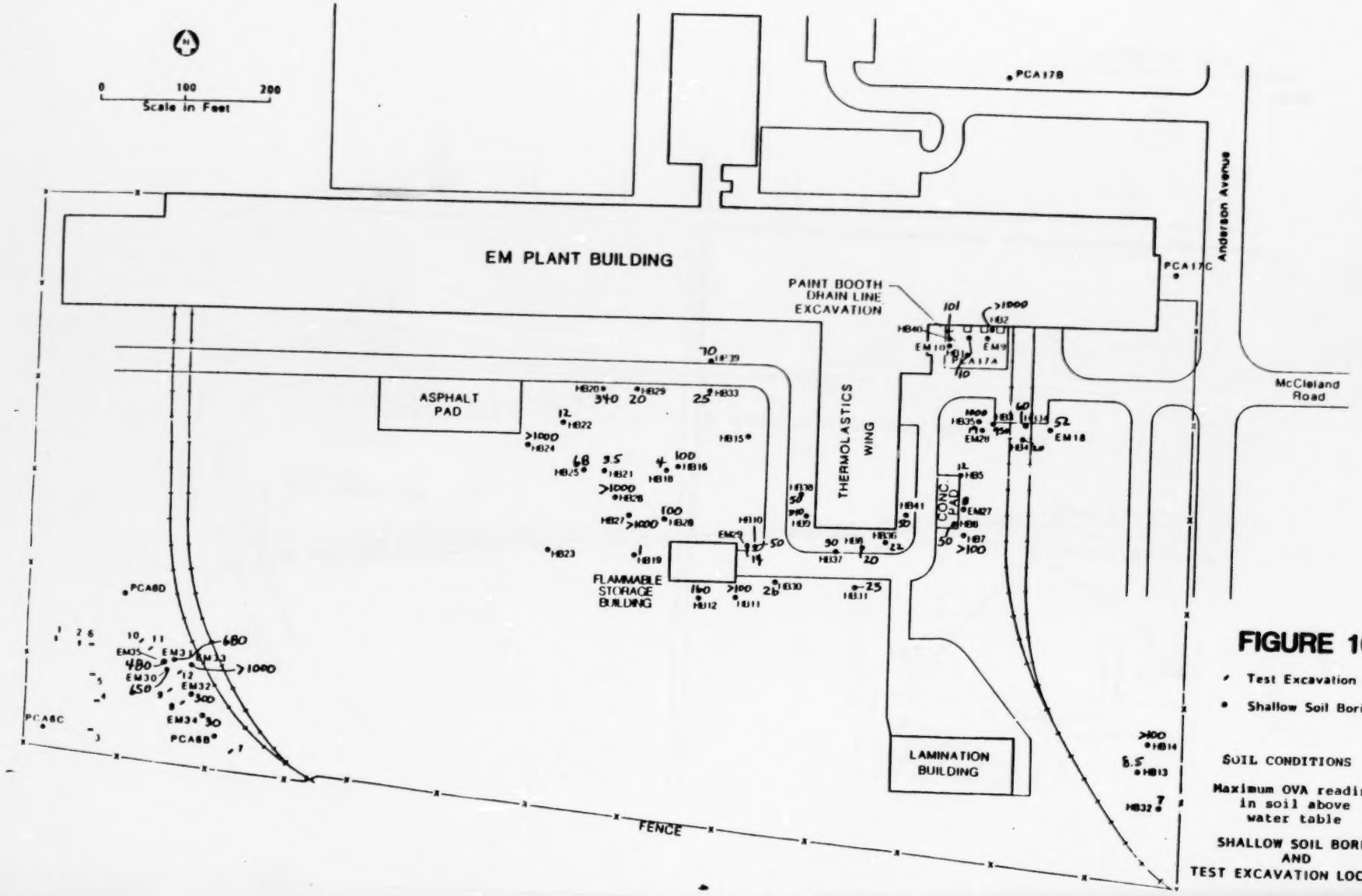


FIGURE 10

- Test Excavation Location
- Shallow Soil Boring

SOIL CONDITIONS

Maximum OVA readings in soil above water table

SHALLOW SOIL BORING AND TEST EXCAVATION LOCATIONS

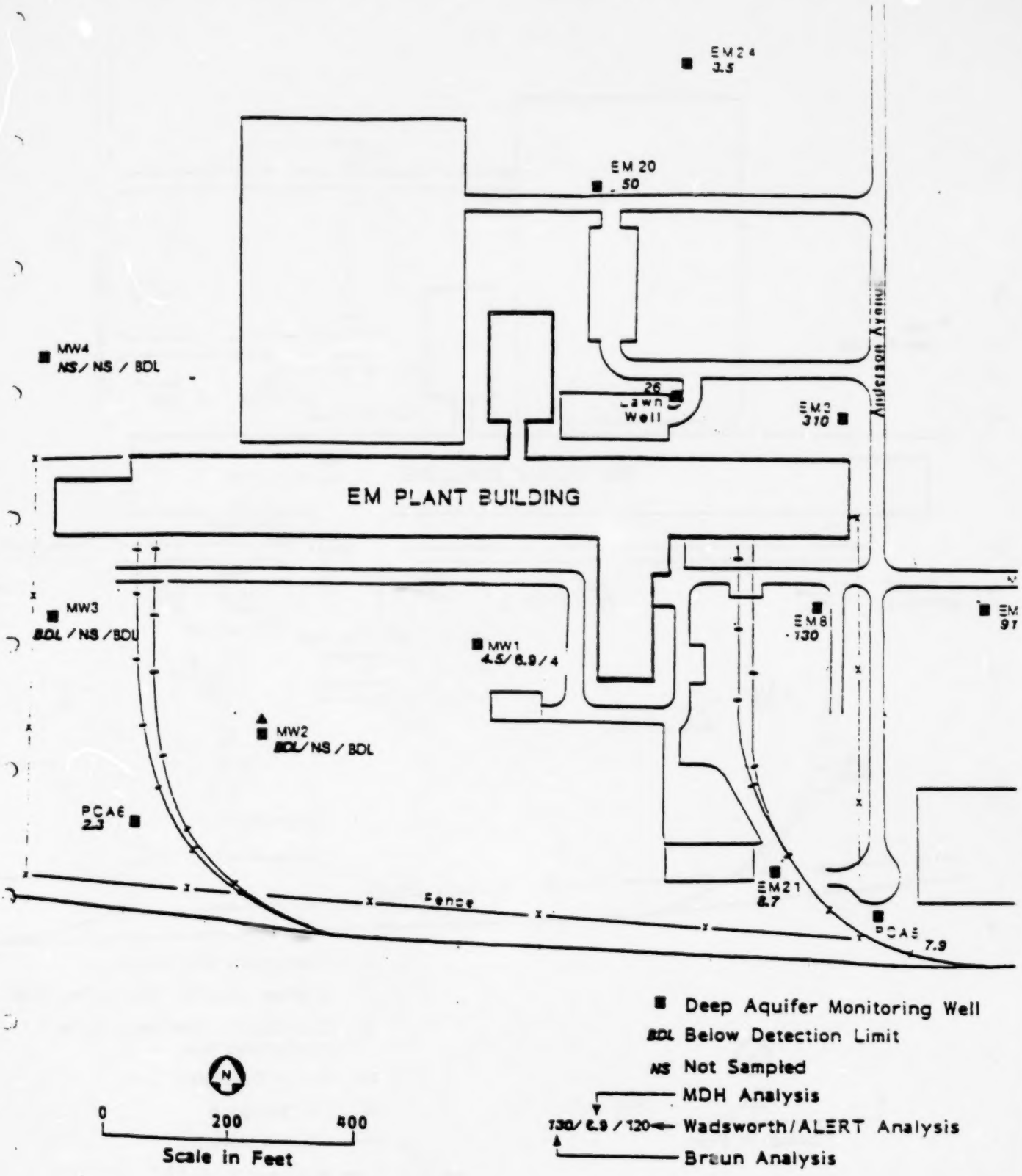


FIGURE 9

TOTAL HALOGENATED VOC CONCENTRATIONS, ug/L
DEEP AQUIFER
October 1987

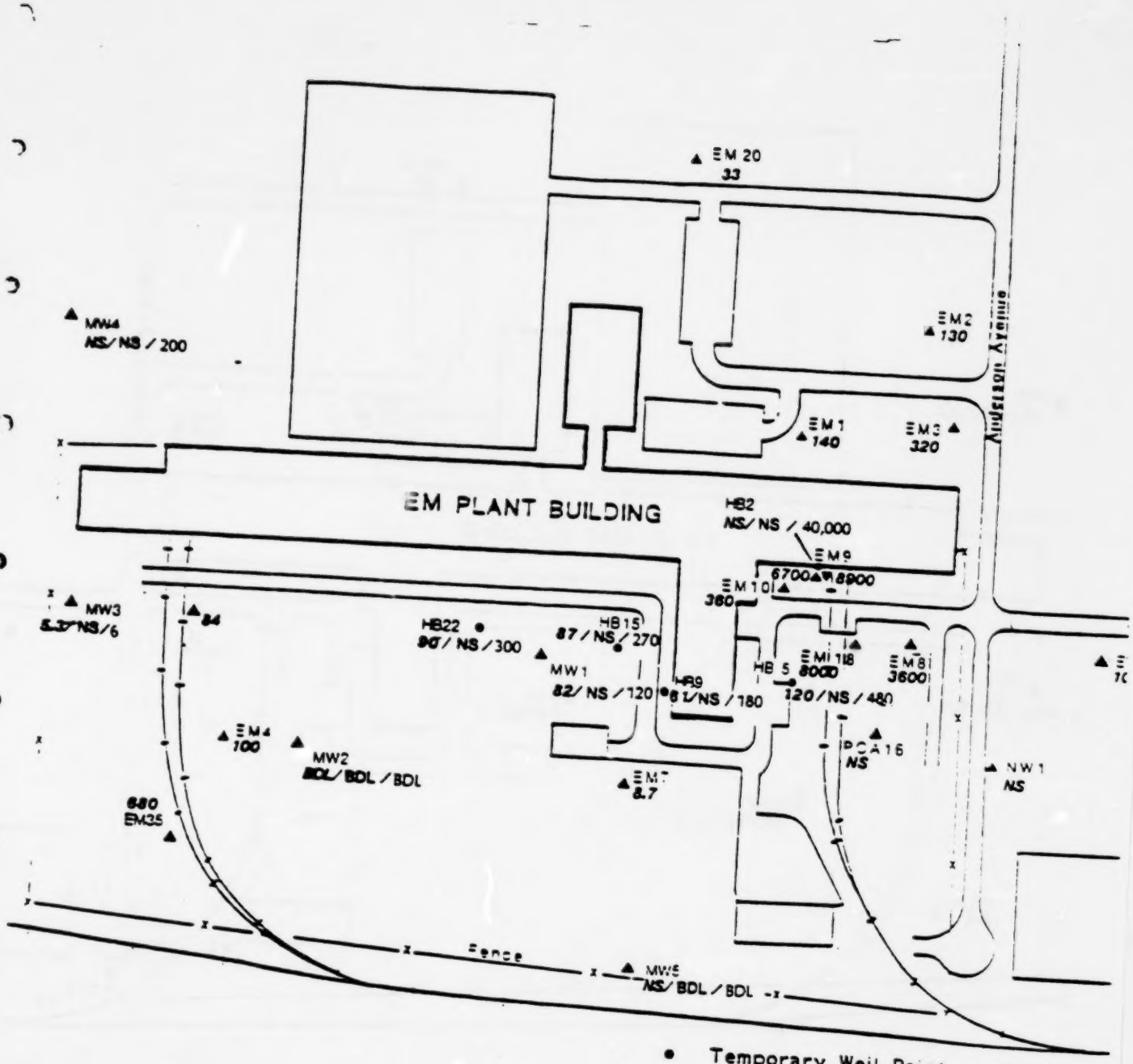


FIGURE 8

TOTAL HALOGENATED VOC CONCENTRATIONS, ug/L
SHALLOW AQUIFER
October, 1987

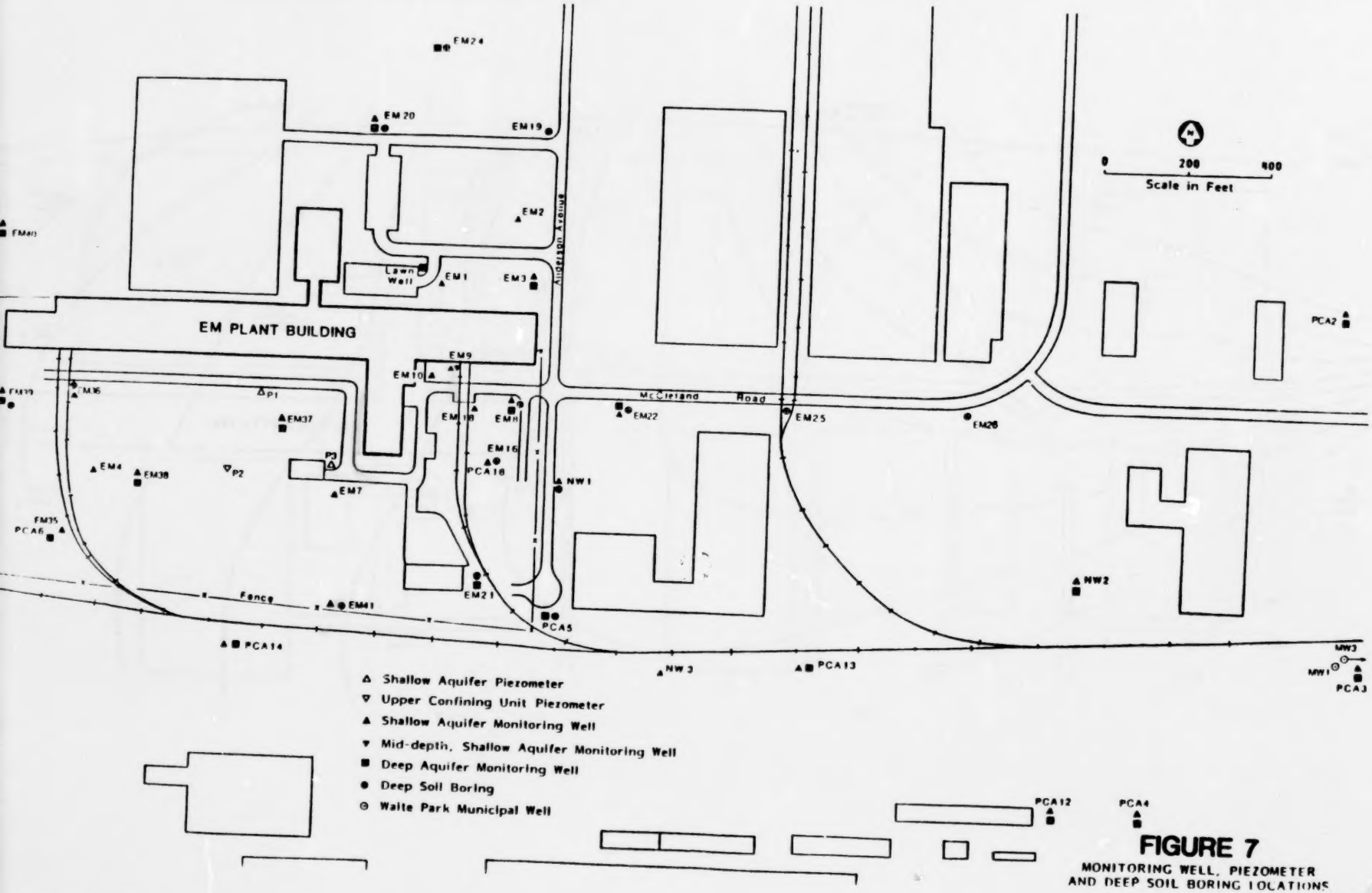


FIGURE 7

MONITORING WELL, PIEZOMETER AND DEEP SOIL BORING LOCATIONS

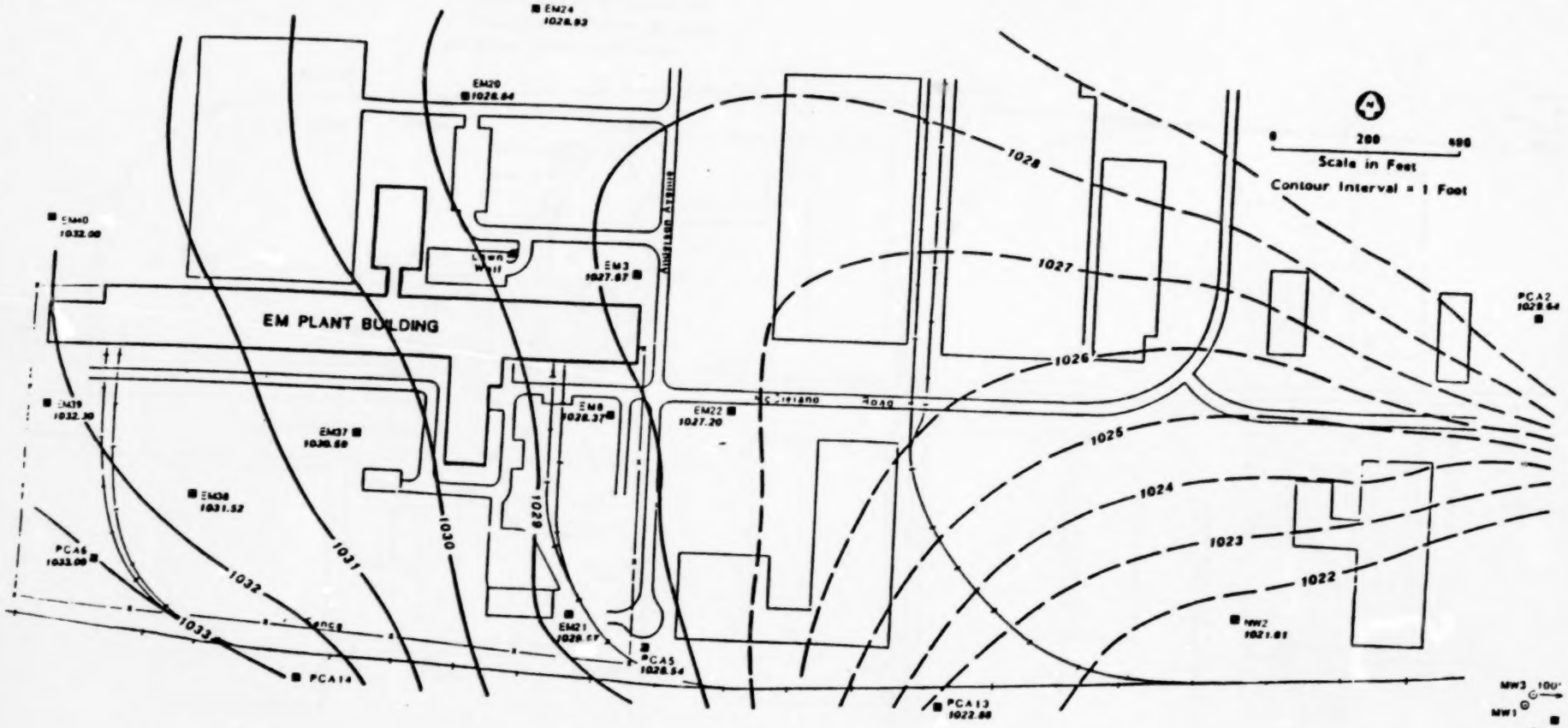


FIGURE 6

City wells pumping

GROUNDWATER ELEVATIONS
DEEP AQUIFER
(FEET, MSL)
June 1988

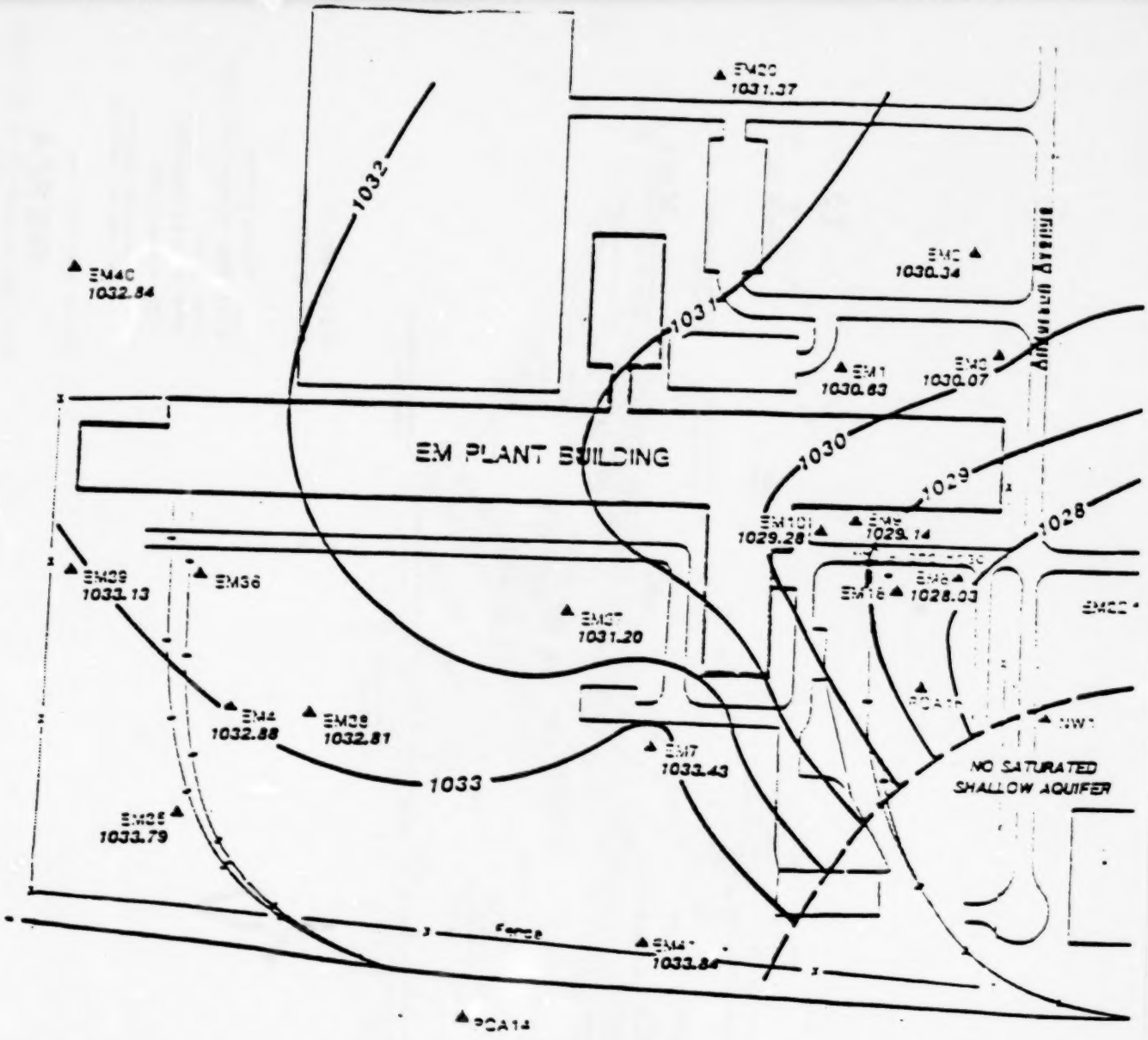
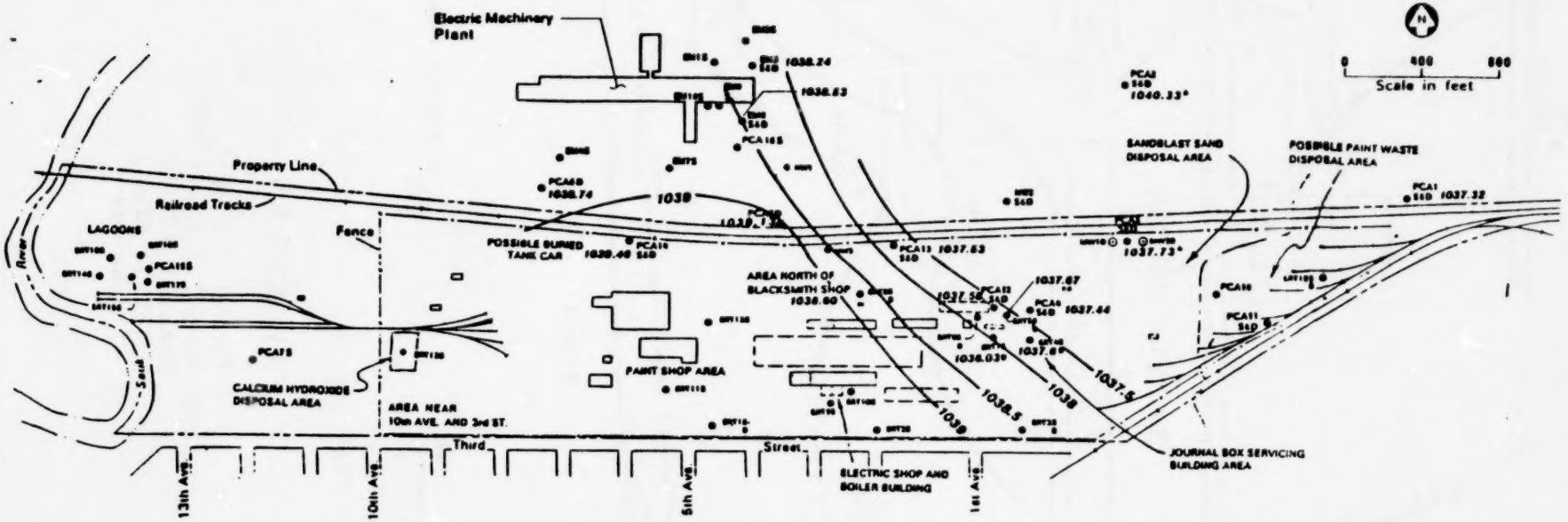


FIGURE 5

City wells pumping
GROUNDWATER ELEVATIONS
SHALLOW AQUIFER
(FEET, MSL)
June 1988.



City wells not pumping

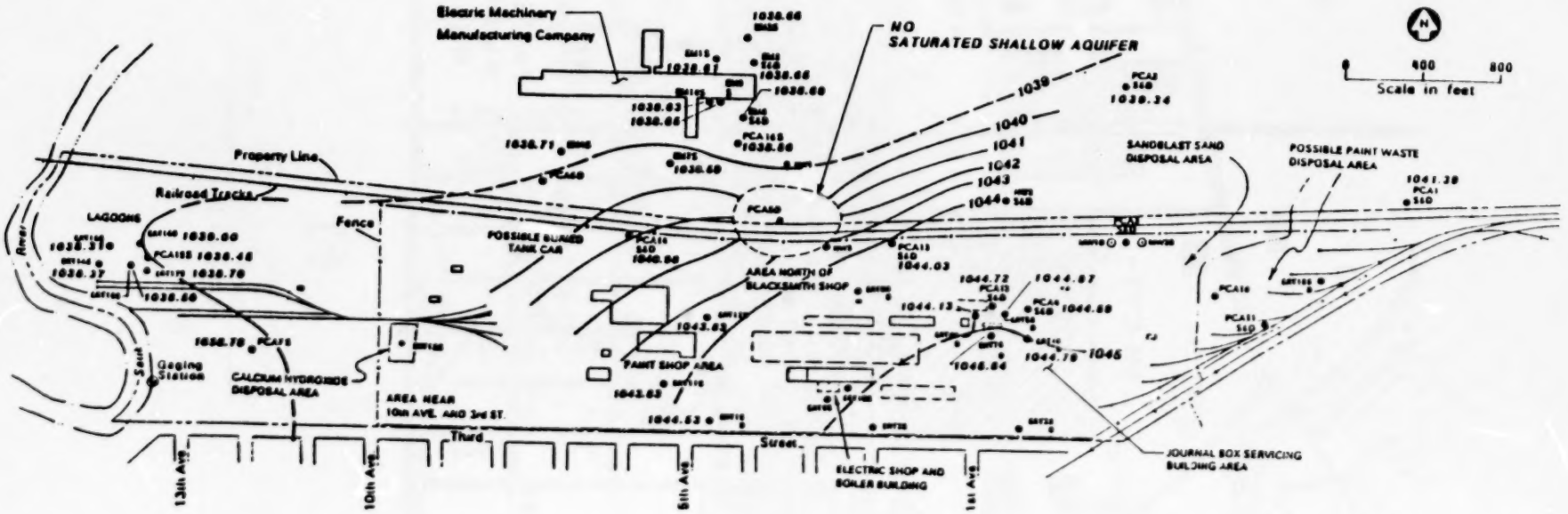
- Existing Building
- Bldg. no longer in existence
- Fence
- Municipal Supply Well
- Monitoring Well
- Groundwater Elevation Not Used for Contouring

Contour Interval 0.5 Feet

FIGURE 4

DEEP AQUIFER GROUNDWATER ELEVATION
(Feet, MSL)

August-September, 1986



City wells not pumping

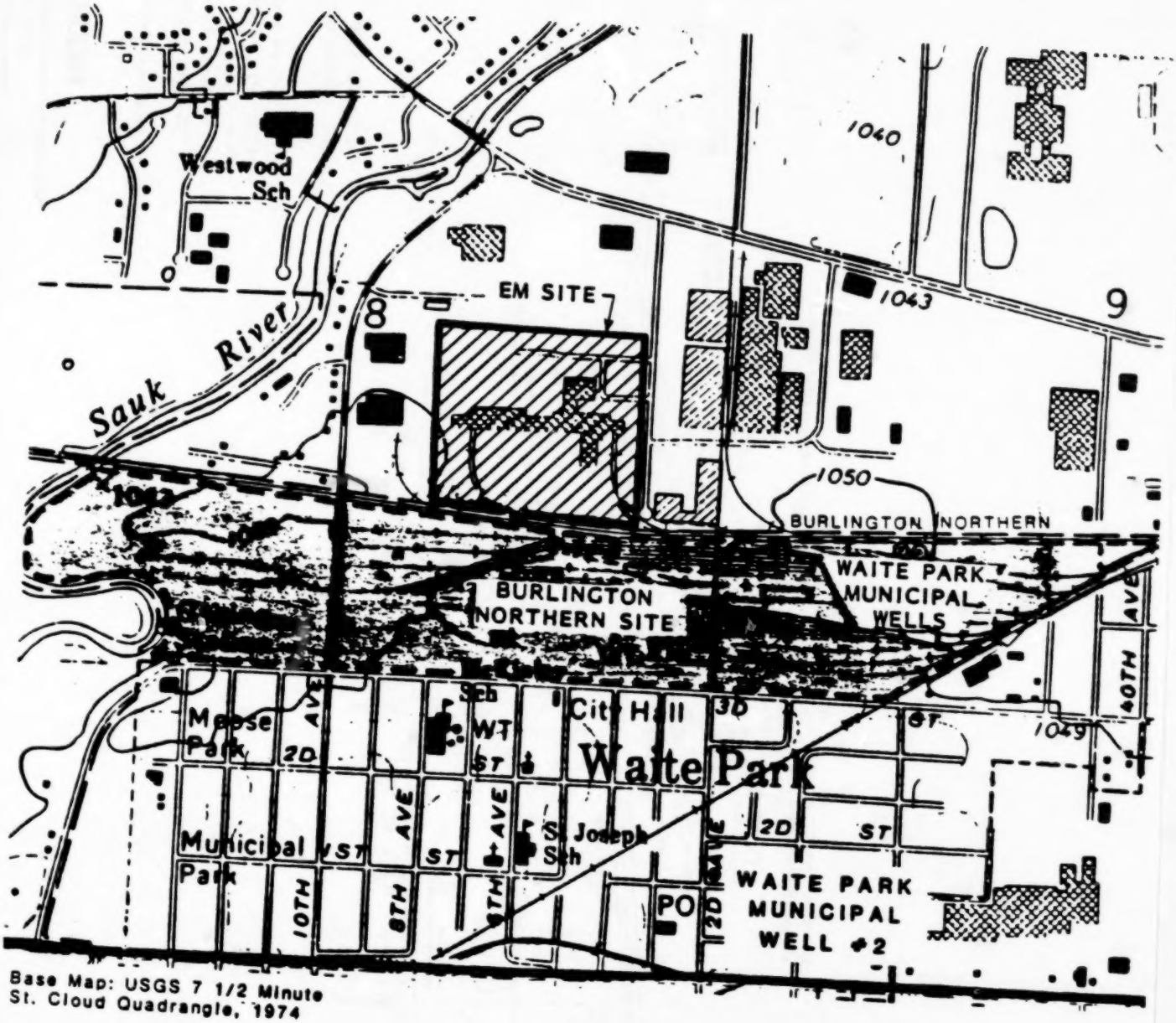
- Existing Building
- Bldg. no longer in existence
- Fence
- Municipal Supply Well
- Monitoring Well

Contour Interval 1 Foot

FIGURE 3

SHALLOW AQUIFER GROUNDWATER ELEVATION (Feet, MSL)

August September, 1986



Reproduced from
best available copy.

FIGURE 2
LOCATION MAP

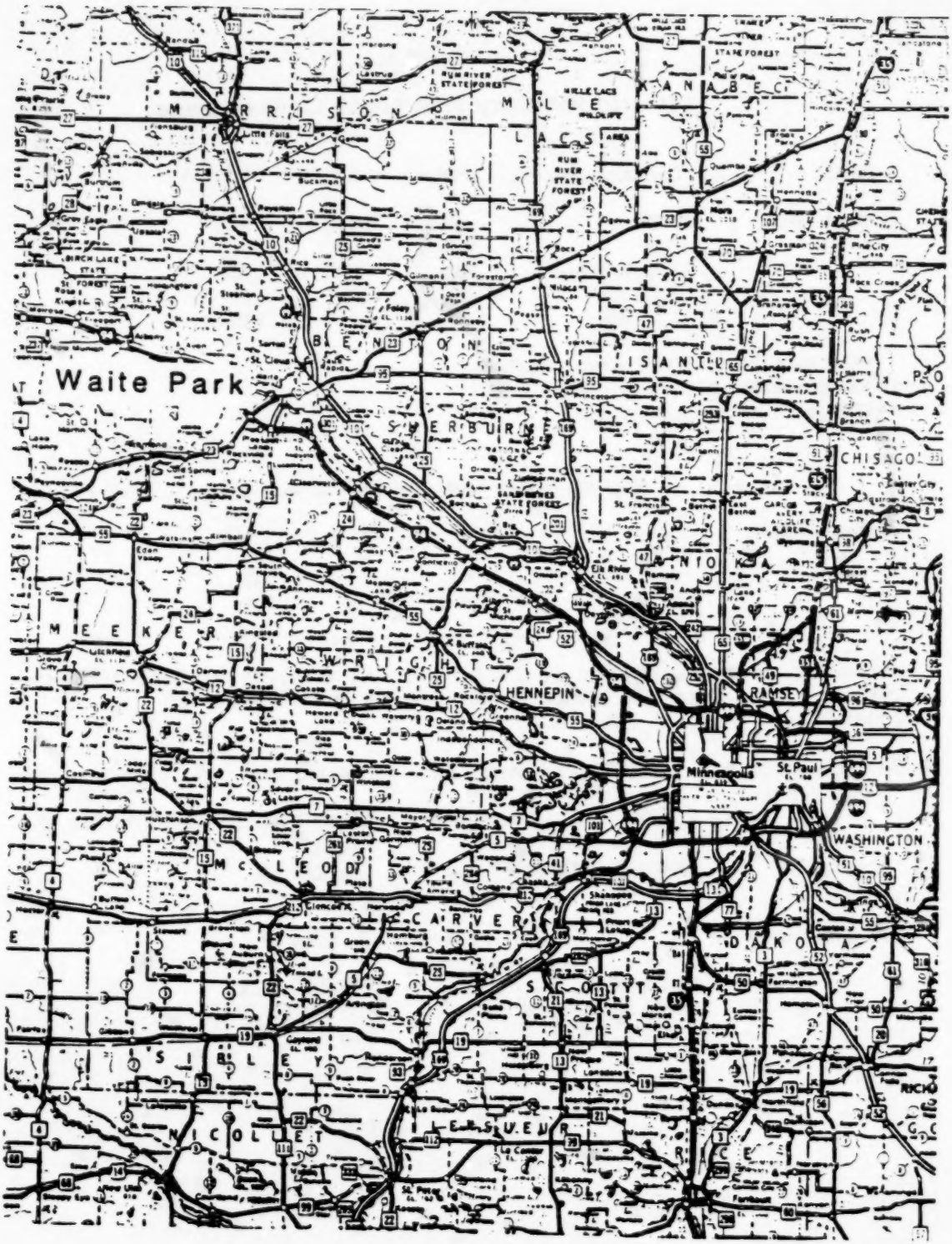


FIGURE 1

LOCATION OF WAITE PARK

Reproduced from best available copy.

TABLE 4

Elecric Machinery Site Target Cleanup Levels

Media	Contaminant	MCL*	RAL**	TCL***
Ground Water	PCE	NA	6.6	6.6
	TCE	5.0	31	5.0
	1,1,1-TCA	200	200	200
	1,2-DCE	NA	70	70
	1,1-DCA	NA	810	810

*Maximum Contaminant Level ug/L
**Recommended Allowable Limit ug/L
***Target Cleanup Level ug/L

Ambient Water Quality Criteria (ug/L)

Surface Water	PCE	8.9
	TCE	123
	1,1,1-TCA	138
	1,2-DCE	449
	1,1-DCA	NA

For water in the Sauk River at discharge point allowing for 7Q10 dilution. Criteria listed are the lower of AWQC for fish consumption or aquatic life toxicity (see Table 1).

Surface Water — NPDES Discharge Permit Limitations

Effluent daily maximum	15 mg/L total hydrocarbons
Maximum discharge	200 gpm
Average discharge	120 gpm

Air Emissions

MDH Action Level Guideline	Modeled Total Projected Risk
1×10^{-5}	5.87×10^{-7}

TABLE 3

COMPARISON AMONG ALTERNATIVES

Evaluation Criteria	Alternatives					
	I	IIA.1	IIA.2	IIB	IIIA	IIIB
Overall protection of human health and the environment	-	-	-	-	+	+
Compliance with ARAR's	-	-	-	-	+	+
Short-term effectiveness	-	-	-	-	+	+
Long-term effectiveness	-	-	-	-	+	+
Reduction of mobility, toxicity, or volume	-	-	-	-	+	+
Implementability	+	+	+	+	+	+
Cost	+	-	-	-	-	-
Community Acceptance	-	-	-	-	-	+
State Acceptance	-	-	-	-	+	+

TABLE 2

SUMMARY OF EVALUATED ALTERNATIVES

Alternative	Effectiveness	Cost*	Reliability	Constructability	Implementation	Secondary Environmental Effects
ALTERNATIVE I Continued ground water monitoring	not effective for shallow or deep aquifers	$236,000	n/a	n/a	immediate	n/a
ALTERNATIVE IIA.1 Shallow aquifer gradient control and discharge to sanitary sewer	not effective for deep aquifer	$553,000	good; possible concern for long-term availability of sanitary discharge	standard construction techniques	one season with 4 month lead; possible permit/ approval delay	no significant secondary effects
ALTERNATIVE IIA.2 Shallow aquifer gradient control, packed tower aeration and discharge to sanitary sewer	not effective for deep aquifer	$726,000	good; possible concern for long-term availability of sanitary discharge	standard construction techniques	one season with 4 month lead; possible permit/ approval delay	no significant secondary effects
ALTERNATIVE IIB Shallow aquifer gradient control, packed tower aeration, and discharge to storm sewer	not effective for deep aquifer	$652,000	good	standard construction techniques	one season with 4 month lead; possible permit/ approval delay	no significant secondary effects
ALTERNATIVE IIIA Shallow and deep aquifer gradient control and discharge to sanitary sewer	effective for both shallow and deep aquifers	$882,000	good; possible concern for long-term availability of sanitary discharge	standard construction techniques	one season with 4 month lead; possible permit/ approval delay	no significant secondary effects
ALTERNATIVE IIIB Shallow and deep aquifer gradient control, packed lower aeration and discharge to storm sewer	effective for both shallow and deep aquifers	$913,000	good	standard construction techniques	one season with 4 month lead; possible permit/ approval delay	no significant secondary effects

* Present worth cost

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO THE ATTENTION OF:

5RA-14

28 SEP 1989

Mr. Gerald L. Willet
Commissioner
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155

Dear Mr. Willet:

Enclosed is the U.S. Environmental Protection Agency's (U.S. EPA's) Declaration Statement which concurs with and adopts the Record of Decision (ROD) completed by Minnesota Pollution Control Agency (MPCA) for the Electric Machinery portion of the Waite Park Wells Site.

Our concurrence with and adoption of the ROD are based on the remedial action plan outlined within the ROD. It is our understanding that the deep aquifer extraction well discussed in the ROD is not currently operating. Apparently, information obtained by the MPCA indicates the capture zone of the Waite Park municipal wells air strippers is sufficient to remediate the deep aquifer plume emanating from the Electric Machinery Site. Therefore, we recommend that MPCA provide to the public an explanation of significant differences in implementation of the remedial action plan.

In addition, we have been informed that the current owners of the Electric Machinery property are interested in selling the property. Our concurrence with your ROD is based on the condition that the site will remain enclosed by a fence with a security system to avoid human exposure to the areas of contaminated soils, regardless of the property owner. We recommend that any potential buyers are made aware through deed restrictions or other means, of the soil contamination and the need to maintain the fence and security system or remediate the soils.

When cleanup levels are attained at this site, the cumulative excess carcinogenic risk is 1.2×10^{-5}. U.S. EPA's policy is to utilize the risk level of 10^{-6} cumulative excess carcinogenic risk as our point of departure. However, the site conditions allow us to vary from this point of departure. The immediate surrounding land uses are light industrial, and the entire area is served by Waite Park and St. Cloud municipal water systems.

We look forward to continuing this productive relationship with MPCA on the Waite Park Wells Site.

Sincerely yours,

for Valdas V. Adamkus
Regional Administrator

Enclosure

5.3 HAZARDOUS WASTE QUANTITIES BY EPA REGION

Figure 5-2 shows the distribution of hazardous waste quantities managed at TSDRs by EPA region. Those regions with concentrations of industries that traditionally generate hazardous wastes show the highest quantities. With the exception of Texas and Louisiana, those areas west of the Mississippi River managed low quantities of hazardous waste. Regions 7, 8, 9, and 10 account for only 3.2 percent of all waste managed in units regulated under RCRA and 17.4 percent of all waste managed in units exempt from RCRA permitting requirements.

This higher percentage of hazardous wastes managed in units exempt from RCRA permitting is primarily due to hazardous wastes in Region 9, which includes California. California regulates wastewater treatment technologies and waste oil recycling, requiring more quantities to be treated or recycled than do many other states. Most states do not regulate waste oil as hazardous. Wastes managed in many of these technologies are reported as quantities managed in units exempt from RCRA permitting requirements.

These results appear to support the view that the following factors may influence the geographical distribution of hazardous waste management activities:

- Industries that typically generate large quantities of hazardous wastewater are not located in the western part of the United States because of less plentiful and, often, more expensive water.

- Industries that typically generate hazardous wastes that are hazardous have been concentrated in the eastern and central part of the country.

- Significant petrochemical and chemical manufacturing facilities are located in the New Jersey-New York area and the Texas-Louisiana areas.

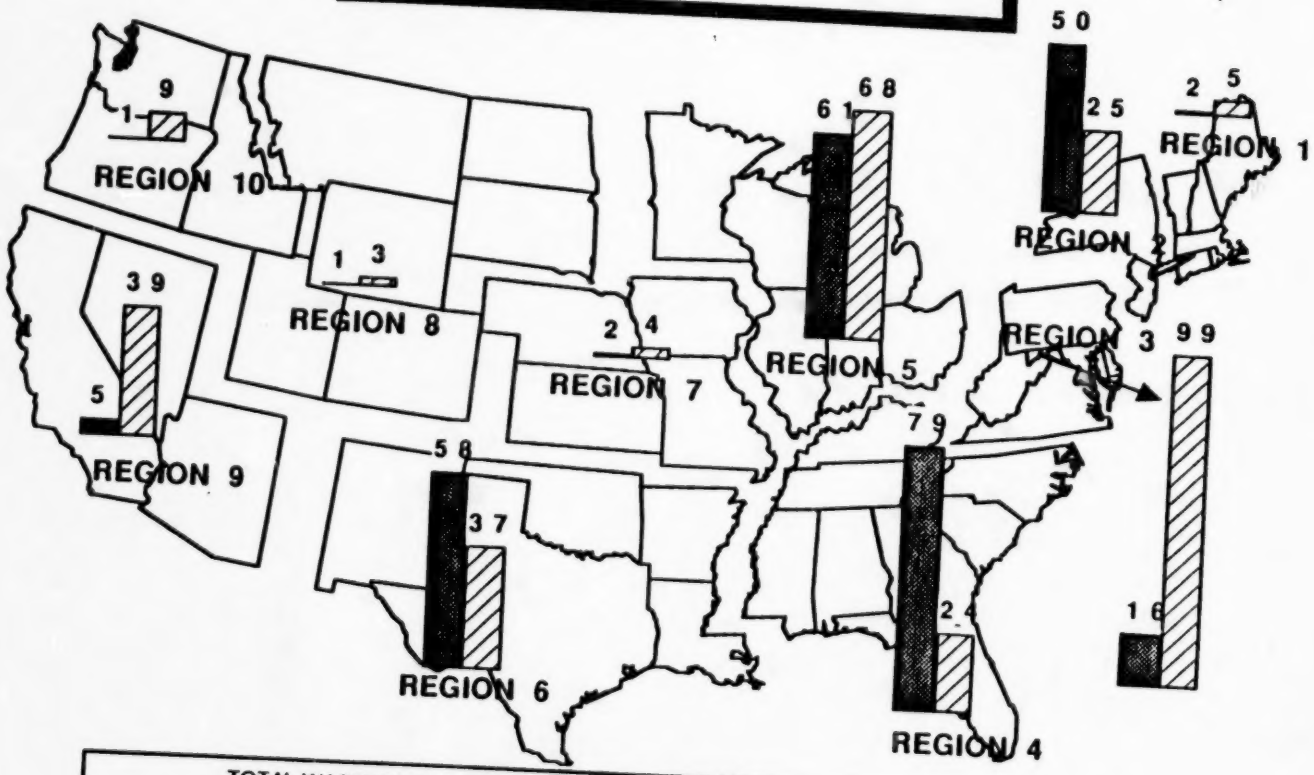
- The western states of the United States typically have lower population densities.

5.4 NUMBER OF FACILITIES

The Screening Survey was mailed to 5,666 facilities. Based on the results of this census there are 2,971 active facilities (as defined in Section 5.1). This total does not include facilities that began operating after January 1986. The follow-up survey will also address the issue of facilities that began or have ceased hazardous waste operations, updating the number of facilities active in 1986.

Figure 5-3 shows the distribution of active TSDR facilities by EPA region. Region 5 has 761 facilities while Region 10, with 71, has the least number of facilities. Of the 259 facilities in Region 9, 223 are located within California. The other states in that region have very small numbers of TSDRs.

FIGURE 5-2 QUANTITY OF HAZARDOUS WASTE MANAGED BY ACTIVE FACILITIES DURING 1985, BY EPA REGION

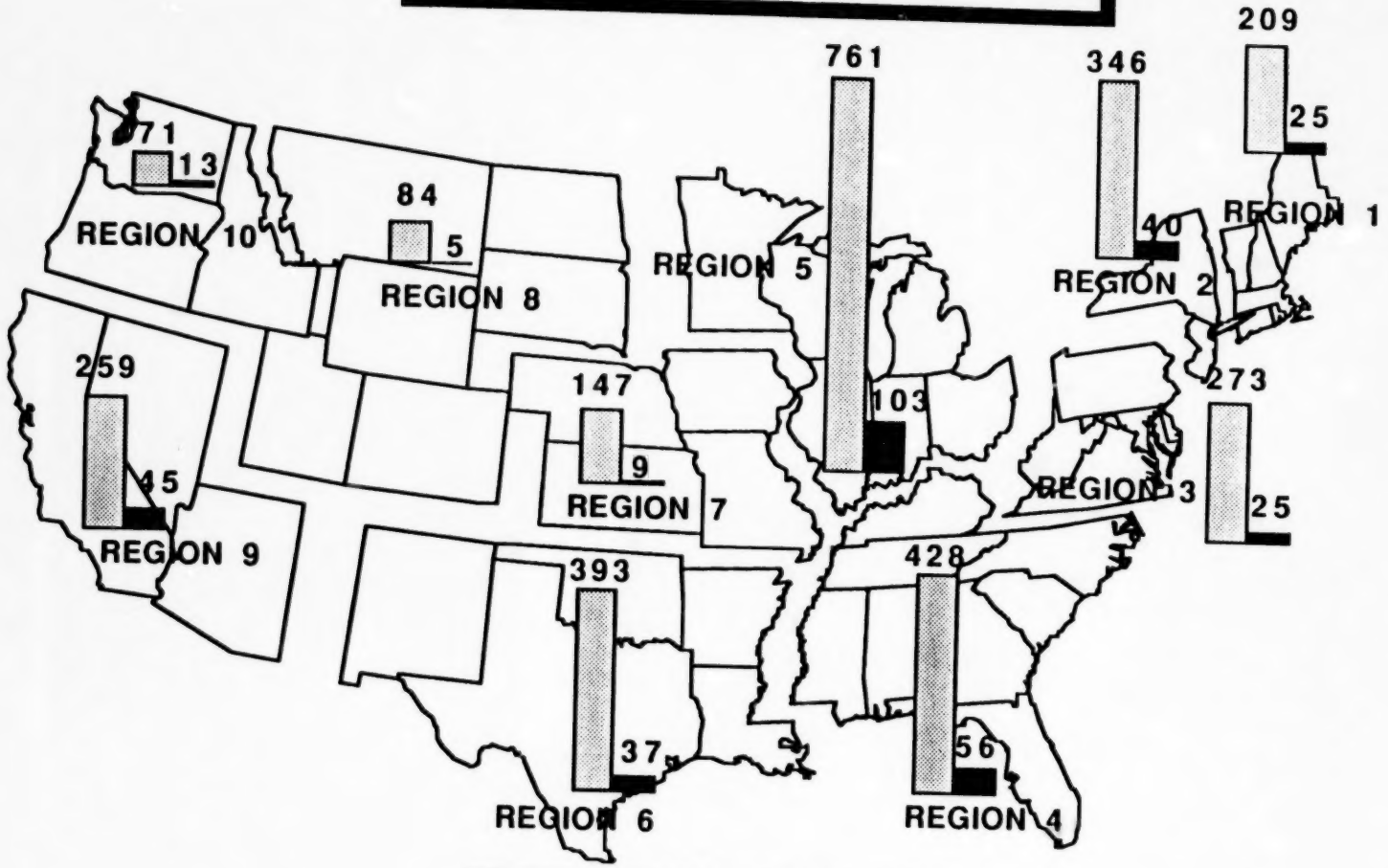


TOTAL WASTE MANAGED IN UNITS REGULATED UNDER RCRA = 272 MMT
TOTAL WASTE MANAGED IN UNITS EXEMPT FROM RCRA PERMITTING REQUIREMENTS = 311 MMT

■ UNITS REGULATED UNDER RCRA ☑ UNITS EXEMPT FROM RCRA PERMITTING REQUIREMENTS

NOTE: Some waste may be managed in both regulated and exempt units. Consequently, the total amount of RCRA hazardous waste is less than the sum of waste managed in exempt and regulated units.

FIGURE 5-3 NUMBER OF ACTIVE FACILITIES DURING 1985, BY EPA REGION



TOTAL NUMBER OF ACTIVE FACILITIES = 2,971

☐ TOTAL FACILITIES ■ COMMERCIAL FACILITIES

NOTE: Commercial facilities include those with at least one commercially available technology. See text for further details.